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Geology of the
Matchinameigus Lake Area
District of Algoma

By

M.J. Downes

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FOREWORD

MATCHINAMEIGUS LAKE AREA

This survey involves an area at the southeastern end of the Wawa Metavolcanic Belt. Knowledge of the geology of the area is necessary to: understand the evolution of the Wawa Belt and its contained mineral deposits; and to assess the area's mineral potential for planning purposes in the Wawa region. The Matchinameigus Lake area was not mapped before this survey. A minor amount of information recorded in the assessment files and on geophysical maps suggested that rocks of a type often associated with mineral deposits might be present in the area. This survey has established the presence and general distribution of potentially significant volcanic and sedimentary rock units. It also provides a sound basis for exploration planning and mineral potential assessment.

E.G. Pye
Director
Ontario Geological Survey

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GEOLOGICAL MAP

(back pocket)

Map 3483 (coloured) - Matchi/manaigan Lake, Algoma District.
Scale 1:31 680 or 1 inch to ½ mile.

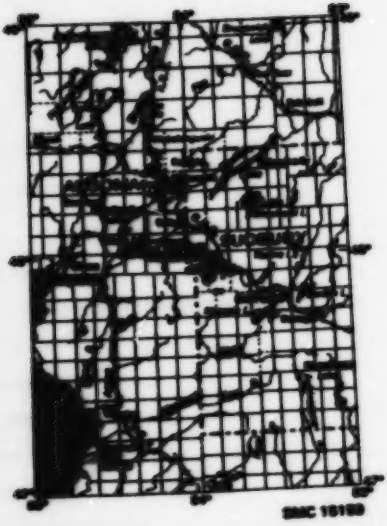

Figure 1--Key map showing the location of the Matchinamigus Lake Area. Scale 1:3 168 000.

ABSTRACT

The Matchinameigus Lake area covers 236 km², and is located about 50 km northeast of Wawa. The area consists of an Early Precambrian metavolcanic-metasedimentary supracrustal sequence that occurs within an east-west syncline at the eastern edge of the Wawa Greenstone Belt. The rocks in this part of the belt are: essentially tholeiitic basalts to andesites at the base; wacke-type sediments containing a banded magnetite ironstone - magnetic quartzite (chert) in the middle, and a mixture of fine-grained felsic to intermediate metavolcanics and wacke metasediments in the upper part. These "upper" metavolcanics contain calc-alkalic, dacitic, and rhyolitic tuffs.

A lower and earlier cycle occurs in the southwest of the belt. It is characterized by a higher proportion of metasediments including a bedded dolostone unit which is exposed over a 1500 m strike length and a 50 to 100 m thickness.

Within the metasediments, the magnetite-ironstone unit forms a consistently traceable, yet occasionally discontinuous stratigraphic marker. This unit has been the object of much of the base metal exploration in the area.

Much of Echum Township is underlain by gneissic granodiorite and trondhjemite, which contain a hybrid dioritic zone 100 to 300 m wide, developed in contact with the supracrustals. A massive and uniform granodiorite in the north of the area is characterized by the presence of doubly-terminated (β) quartz, which is indicative of a high level intrusive. Weakly foliated quartz monzonite and granodiorite occur in the southwestern part of the map-area, and form part of the supracrustal envelope. The northern and southwestern stocks are considered by the author to be late phase phenomena.

Later intrusive events consist of coarse-grained pyroxenites as plugs and an arcuate dike, diabase dikes, and two lamprophyric dikes of kimberlitic affinity.

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CONVERSION FACTORS FOR MEASUREMENTS IN ONTARIO GEOLOGICAL SURVEY PUBLICATIONS

If the reader wishes to convert imperial units to SI (metric) units or SI units to imperial units the following multipliers should be used:

CONVERSION FROM SI TO IMPERIAL			CONVERSION FROM IMPERIAL TO SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
			LENGTH		
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709 7	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
			AREA		
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
			VOLUME		
1 cm^3	0.061 02	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.308 0	cubic yards	1 cubic yard	0.764 555	m^3
			CAPACITY		
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
			MASS		
1 g	0.035 273 96	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 75	ounces (troy)	1 ounce (troy)	31.103 476 8	g
1 kg	2.204 62	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	907.184 74	kg
1 t	1.102 311	tons (short)	1 ton (short)	0.907 184 74	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	1016.046 908 8	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	1.016 046 908 8	t
			CONCENTRATION		
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

1 ounce (troy)/ton (short)	20.0	pennyweights/ton (short)
1 pennyweight/ton (short)	0.05	ounce (troy)/ton (short)

NOTE–Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries published by The Mining Association of Canada in co-operation with the Coal Association of Canada.

Geology of the
Matchinameigus Lake Area
District of Algoma

by

M.J. Downes[1]

INTRODUCTION

The Matchinameigus Lake area, District of Algoma is located some 50 km northeast of Wawa, and covers an area of 236 km^2. The area lies within the Sault Ste. Marie Mining Division; and is bounded to the west, north, and east by the boundaries of Dolson Township (formerly Township 25, Range 25) and Echum Township (formerly Township 43), and is bounded to the south by Latitude 48°05'.

The area includes the eastern part of the Wawa Belt which is composed of metavolcanics and metasediments. Base metals and a gold occurrence have been targets for exploration activity in the area.

Acknowledgments

The author was assisted in the field by Jim Owen as senior assistant, and by Gary Hicks, Terry Milinoff, and Patricia Schnorr as junior assistants. Information provided by Mr. Floria of Matchinameigus Lake was of considerable help. The author also acknowledges the help of the Wawa office of the Ontario Ministry of Natural Resources who assisted in providing accommodation near the field area.

Access

Within the eastern township of Echum, access is good from Highway 651, the main Canadian Pacific railway, and Matchinameigus and Shikwamkwa

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[1]Formerly Geologist with Precambrian Geology Section, Ontario Geological Survey, Toronto.

Approved for publication by the Chief Geologist, Precambrian Section, Ontario Geological Survey, Toronto. December 23, 1980.

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Lakes. Within the township of Dolson, to the west, access is more difficult because no roads or usable waterways exist. Noranda and Upper Dingman Lakes can be reached by float-equipped aircraft from Wawa. The remainder of the area is accessible by helicopter, where lakes are too small for access by fixed-wing aircraft.

Present Geological Survey

The survey for this report was undertaken in the summer of 1978. Traverses were by pace and compass using topographic control from air photographs on a scale of 1 inch to ¼ mile (1:15 840) provided by the Division of Forests, Ontario Ministry of Natural Resources. The basemap (scale 1 inch to ¼ mile) was prepared by the Cartographic Section, Division of Lands, Ontario Ministry of Natural Resources. Geology in this report is not tied to surveyed lines. Uncoloured preliminary maps of the area (P.2302 and P.2303) at a scale of 1 inch to ¼ mile (1:15 840) were issued in 1979 (Downes 1979a, 1979b).

Previous Geological Work

The first geological reference to the area was in a report by A.B. Willmott (1898). Mapping on a scale of 1 inch to 1 mile was done in the area in 1918 by W.H. Collins and in 1920-22 by E. Thomson (Collins and Thomson 1925). A later report by E.M. Burwash (1937) includes part of the present map-area. The map-area is covered by the regional compilation sheet Ontario Department of Mines Map 2220 (Milne *et al.* 1972). Reconnaissance mapping at a scale of 1 inch to 1 mile was done by Algoma Central Railway geologists in 1961 over parts of Echum, Dolson, Keesickquayash, and Laforme Townships (Resident Geologist's Files Ontario Ministry of Natural Resources, Sault Ste. Marie, Assessment File Numbers 841, 851, 852, 426).

Topography

The topography is flat to moderately hilly with most elevations around 360 m above msl. The highest point has an elevation of 575 m above msl, and is located near Beaver Lake in the southern part of Dolson Township. Much of the central and northern parts of Dolson Township are flat and swamp covered. Bedrock exposure is moderate to good in Echum Township and southern Dolson Township, but is poor in much of central and northern Dolson Township.

History of Mineral Exploration

During the 1890s, the Michipicoten Mining District was prospected for gold (Willmott 1898). Gold prospecting has been active in that area in recent years, but the map-area has received little attention because of the lack of showings. A gold showing, (8)[1] in Echum Township was trenched and sampled by J.P. Davies in 1973 (SSM 1696[2]) but remains untested by diamond drilling. Two major periods of base-metal exploration took place, these occurred in the late 1950s and in the late 1960s.

In 1955, MacFie Explorations Limited [1955] (6) diamond drilled five holes totalling 280.6 m in length, within the metavolcanics in the south-central part of Dolson Township. The best intersection returned 0.07 percent Cu and 0.03 percent Ni over 2 m (SSM 239). In 1956, Belmine Explorations Limited [1956] (1), performed a resistivity survey and diamond-drilling on two areas located in Dolson Township.

The major conductors were identified as a zone containing magnetite ironstone and some disseminated pyrrhotite zones.

In 1955, an airborne magnetometer and electromagnetic survey was carried out by Aeromagnetic Surveys Limited for Hopkins Exploration Consultants (SSM 238), who had optioned a 72-claim block from Frobisher Limited. The survey covered 58 km^2 and included a gamma radiation detector (scintillometric counter). A subsequent ground electromagnetic survey over 15 line km was done for Hopkins Exploration Consultants in 1956 (unspecified area and type of electromagnetic survey; SSM 238). Follow-up diamond drilling of seven holes totalling 914 m in length in 1956 (SSM 238) and a further seven holes totalling 332.1 m in 1957, were put down by Hopkins Exploration Consultants (SSM 238). Ironstones were the main conductors intersected.

In 1966, Multi-Minerals Limited drilled a total of 81.7 m in four holes in the same area as that investigated by MacFie Explorations Limited, but nothing of economic interest was reported (SSM 1130). Limited data suggests that they (Multi-Minerals) were drilling geophysical anomalies.

Questor Surveys Limited conducted an airborne magnetometer and input electromagnetic survey for the Ontario Syndicate in 1970 covering 48 km^2 in Echum and part of Dolson Tonwships. Subsequent ground geophysical follow-up of vertical loop electromagnetic and magnetometer surveys for the Ontario Syndicate was done in the east-central part of Dolson Township. Coincident magnetic and electromagnetic anomalies occurred over the same area that was previously drilled by Belmine Explorations Limited (*see* SSM 236). Even though these areas were delineated for diamond drilling, none were tested by drilling (SSM 1639).

Talisman Mines Limited acquired a 14-claim group from Hopkins Exploration Consultants on the western edge of Dolson Township in 1968 and reassessed the airborne geophysical work done by Hopkins Consultants Limited in 1956-57 and the work done by Multi-Minerals Limited in 1966. Talisman

[1]The number in parentheses refers to the property number listed on Map 2483, back pocket.

[2]This, and subsequent referenced numbers refers to the Company report on file with the Resident Geologist, Ontario Ministry of Natural Resources, Sault Ste. Marie.

Mines Limited pointed out three anomalous areas of interest, but no drilling is recorded (SSM 1326).

GENERAL GEOLOGY

The Matchinameigus Lake area is underlain by a sequence of supracrustal rocks within a southeast-northwest-trending syncline lying at the eastern edge of the Wawa Volcanic Belt. Assemblages which characterize this part of the belt comprise essentially two volcanic cycles. The first, which is exposed in the southwestern part of the map area, on the south limb of the syncline, consists of basaltic metavolcanics progressing upward to rhyolitic and dacitic tuffs (Photos 1 to 5). Within this sequence are interbeds of arkose and finely laminated wacke with reworked tuff, and a bedded dolostone unit which is exposed over a 1500 m strike length and is 50 to 100 m in thickness.

This first cycle does not appear to occur on the northern limb of the syncline. The second cycle consists of tholeiitic basalts at the base passing upwards into andesite, dacite, and rhyolitic tuff of a distal character at the top. At or about the transition from basalt to andesite, occur wacke-type metasediments and tuff horizons containing a banded magnetite ironstone - magnetite metachert unit.

The magnetite ironstone unit forms a consistently traceable, yet occasionally discontinuous stratigraphic marker around the southern margin of Lake Matchinameigus. This unit has been the object of much of the base-metal exploration in the area. It is dominantly composed of interbanded sucrosic quartz layers and medium-grained magnetite ironstone layers commonly about 1 to 5 mm thick, with occasional disseminated pyrite and/or pyrrhotite with traces of chalcopyrite and sphalerite. None of the observed occurrences amount to quantities or grades of economic significance.

A granodioritic stock which is located just north of Ballard Lake, is characteristically homogeneous and massive, and contains small doubly terminated quartz crystals (β quartz) and poikiloblastic potassic feldspar. The author considers the stock to be a late stage intrusive with possible genetic relations to gold mineralization in the area.

In the southwestern part of the map-area, another late felsic intrusive occurs which is, characteristically moderately potassic, granodioritic to quartz monzonitic. It contains about 1 percent allanite as a minor phase.

Trondhjemites predominate over much of the remaining area of gneissic terrain. A variety of diatexitic and relict palaeosome occur in these rocks.

Coarse-grained lamprophyric and pyroxenitic plugs intrude both the supracrustal and granitoid gneisses. In one locality, (*see* section on "Description of Properties and Occurrences"), the rocks contain about 5 percent sulphide minerals such as pyrite and traces of chalcopyrite.

Many diabase dikes trending predominantly N20°W and a minor set trending northeast, intrude all of the rocks mentioned.

Finally, two small dikes of ultramafic lamprophyre with kimberlitic affinities occur in the area.

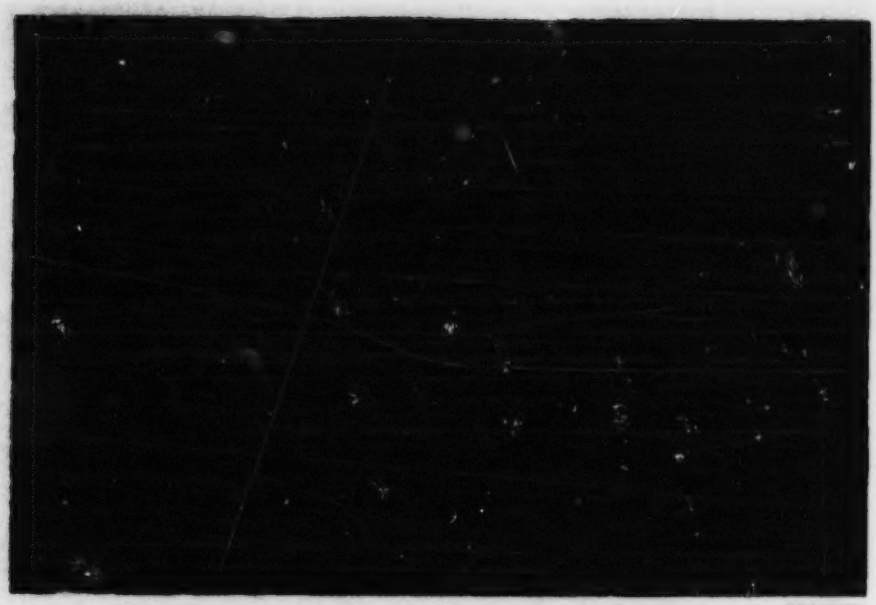
Except for a few areas of good exposure, unconsolidated Pleistocene glacial deposits and Recent swamp deposits form extensive overburden.

OGS 10 581

Photo 1–Finely laminated andesitic tuffs occurring stratigraphically above the main magnetitic iron-stone-chert unit.

OGS 10 582

Photo 2–Finely laminated dacitic tuffs injected by an aplite vein.



OGS 10 563

Photo 3–Mottled texture in dacitic tuffs, probably a result of a 'soft sediment' type of deformation.

OGS 10 564

Photo 4–Photomicrograph of felsic tuff composed of quartz, plagioclase feldspar, and minor biotite and muscovite. Usually, muscovite is present rather than potassic feldspar (plane light).

TABLE 1 | **TABLE OF LITHOLOGIC UNITS FOR THE MATCHINAMEIGUS LAKE AREA.**

PHANEROZOIC

CENOZOIC

QUATERNARY

PLEISTOCENE AND RECENT

Clay, sand, gravel, silt, till and swamp deposits.

Unconformity

PRECAMBRIAN

LATE PRECAMBRIAN

ULTRAMAFIC INTRUSIVE ROCKS

Lamprophyres of kimberlitic affinity, mica peridotite.

Intrusive Contact

MAFIC INTRUSIVE ROCKS

Diabase, quartz diabase, porphyritic diabase.

Intrusive Contact

MIDDLE PRECAMBRIAN

ULTRAMAFIC TO MAFIC INTRUSIVE ROCKS

Pyroxenite, hornblende pyroxenite, mica peridotite.

Intrusive Contact

EARLY PRECAMBRIAN

FELSIC INTRUSIVE ROCKS

LATE FELSIC INTRUSIVE ROCKS

Massive granodiorite, weakly foliated quartz monzonite, felsite, aplite, pegmatite.

Intrusive Contact

EARLY FELSIC INTRUSIVE ROCKS

Trondhjemite, hornblende trondhjemite, granodiorite, diorite, amphibolite, agmatitic migmatite, migmatic granitic rocks, biotite-quartz-feldspar gneiss, quartzofeldspathic schist.

Intrusive Contact

MAFIC INTRUSIVE ROCKS

Metagabbro.

Intrusive Contact

METAVOLCANICS AND METASEDIMENTS

CHEMICAL METASEDIMENTS

Chert, magnetite ironstone, dolostone.

CLASTIC METASEDIMENTS

Wacke, arkose, siltstone, phyllite, conglomerate, quartz-plagioclase-biotite schist.

FELSIC METAVOLCANICS

Massive and porphyritic flows, tuffs, lapilli-tuffs.

INTERMEDIATE METAVOLCANICS

Andesitic flows and tuffs, crystal tuffs.

MAFIC METAVOLCANICS

Massive, foliated, amygdaloidal and pillowed flows, tuffs, chlorite schist.

OGS 10 585

Photo 5–Photomicrograph of intermediate tuff. Broad bands of quartz and feldspar alternate with amphibole-rich bands, biotite is absent (plane light).

Early Precambrian

METAVOLCANICS AND METASEDIMENTS

Mafic to Intermediate Metavolcanics

Mafic to intermediate metavolcanics make up over two-thirds of the supracrustal rocks in the map-area, and include massive, pillowed, foliated, and fragmental types. The massive rocks vary from dark green or black to a middle grey. In most of these rocks, the chlorite content is low or absent. Foliated rocks are largely those with some chlorite present.

Metamorphism varies throughout the metavolcanic sequence. The lowest metamorphic grade was observed in the northwest of the map-area (close to Upper Dingman Lake) where the rocks are of upper greenschist facies rank. Mineral assemblages (*see* Table 9) which characterize these rocks are: chlorite, actinolite, epidote, plagioclase, and quartz with traces of carbonate. Plagioclase

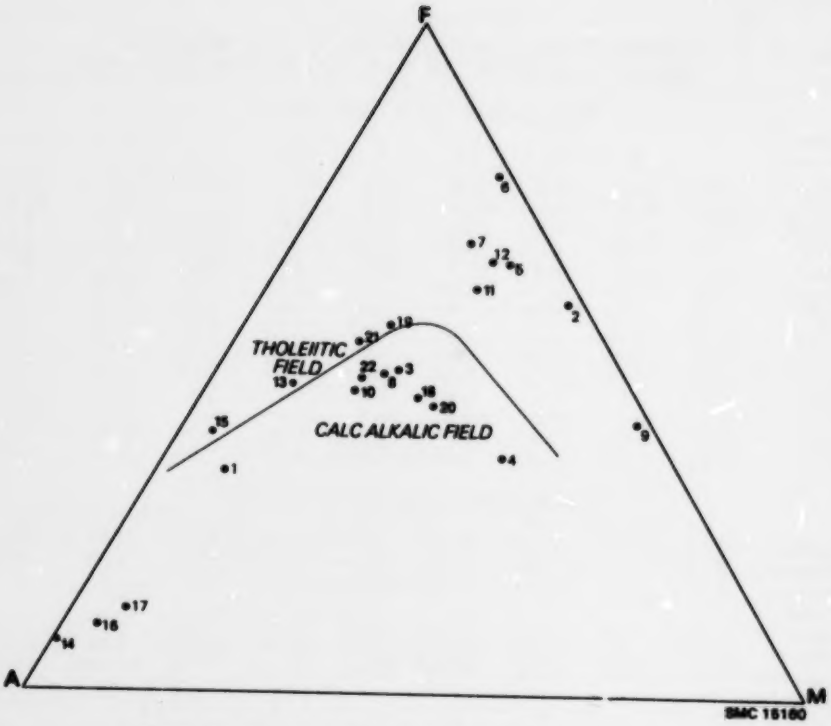


Figure 2–AFM ternary diagram of the metavolcanics from the Matchinameigus Lake Area. See Tables 2, 3, 8, and 9 for data on samples.

compositions were determined by measuring certain extinction angles, and are in the range of albite to oligoclase. Thus, the metamorphic grade is at the transition from upper greenschist to lower amphibolite (Turner 1968; Miyashiro 1973).

Mineral assemblages (*see* Table 9) which characterize the mafic metavolcanics in the north-central part of the belt are; actinolitic hornblende, epidote, plagioclase, and trace amounts of quartz and opaque minerals. Plagioclase compositions in these rocks are in the range An_{45} to An_{50} (andesine). This assemblage indicates a lower amphibolite grade (Turner 1968). Within these rocks, primary structures and textures are absent or poorly recognizable.

Nine chemical analyses and norms of mafic to intermediate metavolcanic samples taken from the area between Ballard, Hand, and Matchinameigus Lakes are given in Table 2. Figure 2 shows the standard AFM plot, and Figure 3 shows the Jensen Cation plot for all the metavolcanics. In both diagrams, points 'straddle' the division between tholeiitic and calc-alkalic fields. The classification systems of Irvine and Baragar (1971) and Jensen (1976) indicate

TABLE 2 CHEMICAL ANALYSES OF MAFIC TO INTERMEDIATE METAVOLCANICS IN THE MATCHINAMEIGUS LAKE AREA

Sample Number	5	6	11	12	4	19	7	2	8
Major Components in Weight Percent									
SiO_2	39.8	46.0	47.9	48.8	51.3	53.2	53.4	54.3	56.8
Al_2O_3	15.9	16.7	14.1	14.4	12.0	15.2	14.5	13.4	16.4
Fe_2O_3	19.6	11.3	16.1	13.1	8.7	13.6	11.8	11.0	8.3
MgO	8.01	2.75	6.30	4.80	9.29	4.00	3.52	6.61	3.30
CaO	9.4	18.0	9.8	14.4	10.7	4.8	12.6	10.7	6.7
Na_2O	1.51	0.15	2.70	1.52	3.67	5.74	1.48	0.03	4.44
K_2O	0.24	0.02	0.29	0.05	1.03	0.02	0.09	0.30	0.32
TiO_2	1.18	0.83	1.24	1.02	0.43	1.26	0.86	0.82	0.85
P_2O_5	0.05	0.06	0.08	0.06	0.05	0.18	0.04	0.05	0.15
MnO	0.31	0.18	0.24	0.24	0.24	0.17	0.14	0.19	0.15
L.O.I.	3.4	3.0	1.0	0.8	1.8	0.7	1.1	3.1	2.0
Total	99.4	99.0	99.8	99.2	99.2	98.9	99.5	100.5	99.4
CO_2	0.57	1.64	0.31	0.26	1.02	0.09	0.34	0.32	0.38
S	0.22	0.02	0.01	0.03	0.04	0.03	0.02	0.21	0.01
Normative Mineralogy in Weight Percent									
Apatite	0.12	0.15	0.19	0.14	0.12	0.43	0.10	0.12	0.36
Pyrrhotite	0.64	0.06	0.03	0.09	0.11	0.09	0.06	0.60	0.03
Ilmenite	2.37	1.66	2.42	1.99	0.85	2.47	1.67	1.61	1.67
Orthoclase	1.50	0.12	1.76	0.30	6.30	0.12	0.55	1.84	1.96
Albite	13.40	1.33	23.44	13.21	28.77	50.03	12.84	0.26	38.83
Anorthite	38.03	47.14	26.16	33.20	13.68	16.13	33.48	36.80	24.68
Corundum	—	—	—	—	—	—	—	—	—
Acmite	—	—	—	—	—	—	—	—	—
Magnetite	4.12	3.55	4.08	3.75	2.90	4.12	3.51	3.48	3.52
Hematite	—	—	—	—	—	—	—	—	—
Wollastonite	—	0.11	—	—	—	—	—	—	—
Enstatite	—	—	7.03	4.70	—	7.74	3.74	12.71	6.61
Ferrosilite	—	—	8.14	5.52	—	10.64	5.33	8.10	5.35
Quartz	—	7.05	—	4.00	—	—	13.34	20.00	10.05
Diopside	4.49	15.53	9.68	16.35	24.56	2.76	11.33	9.34	4.07
Forsterite	13.35	—	3.21	—	8.79	0.87	—	—	—
Fayalite	17.31	—	4.10	—	3.77	1.32	—	—	—
Nepheline	0.08	—	—	—	1.81	—	—	—	—
Leucite	—	—	—	—	—	—	—	—	—
Kaliophilite	—	—	—	—	—	—	—	—	—
Hedenbergite	4.6	23.29	9.77	16.74	8.33	3.30	14.08	5.19	2.88
Cancrinite	—	—	—	—	—	—	—	—	—
Rutile	—	—	—	—	—	—	—	—	—
TOTAL	100.01	99.99	100.01	99.99	99.99	100.02	100.03	100.05	100.01

Note: Chemical analyses performed by Geoscience Laboratories, Ontario Geological Survey, Toronto.

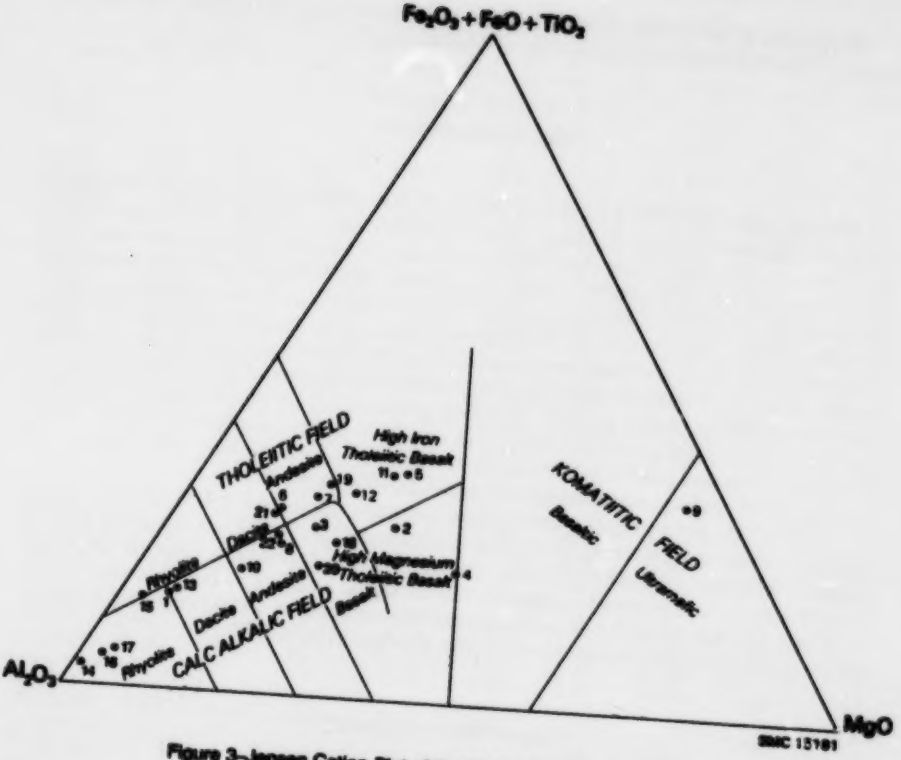


Figure 3–Jensen Cation Plot of the Metavolcanics in the Matchinamegue Lake Area. See Tables 2, 3, 8, and 9 for data on samples.

that the mafic metavolcanics in the north part of the belt fall predominantly in the high-iron tholeiitic basalt field.

Analysis 4 (*see* Figures 2 and 3) represents a mafic metavolcanic rock that lies close to the contact with the granodioritic stock to the north. Thin section examination reveals that the specimen contains about 10 percent microcline. This indicates the rock has been metasomatically altered.

Intermediate Metavolcanics

Medium-grained and fine-grained grey tuffs of andesitic composition dominate the central part of the syncline. These rocks comprise tuffs which are generally poorly bedded, fine grained, and medium to dark grey, and lie within the central part of the syncline, that is above the interbanded metachert-magnetite ironstone. All analyses plot within the calc-alkalic field on the Jensen Cation plot (Figure 3). Their calc-alkalic composition contrasts with rocks stratigraphically below the ironstone which are tholeiitic.

Examples of analyses of the calc-alkalic andesites are 22 and 20 (*see* Tables 3 and 8). Further analyses are given in Tables 4 and 5.

Felsic Metavolcanics

Calc-alkalic rhyolite and dacite occur in the east-central part of the map-area, on Matchinamegus Lake, located within the middle of the syncline. Analyses 16, 17, and 14 (*see* Tables 3 and 8) are examples of rhyolites from this core area, and are fine grained, well laminated, tuffs. These rocks are cream to white on the weathered surface and pale grey to white on fresh surfaces. A porphyritic dacite unit occurs on Matchinamegus Lake, and is conformable with the felsic tuffs. The unit is approximately 3 m wide and is exposed over a strike length of 300 m. The rock contains plagioclase phenocrysts up to 2 cm in length that are andesine (An_{32}) and set in a fine-grained groundmass containing plagioclase (An_{29}). This could be a flow unit, or a subvolcanic intrusion. Apart from this unit, flows and coarse pyroclastics are absent from the felsic volcanics.

Assays of various samples are presented in Table 6.

A principal petrographic distinction between felsic and intermediate rocks is the presence of muscovite in the felsic rocks; microcline is not common as the potassic feldspar. In rocks of more intermediate composition, biotite becomes more common, but is always subordinate in modal amount to hornblende.

Even though most felsic to intermediate tuffs show a granoblastic texture in thin section, slight variations in grain size are still visible.

Clastic Metasediments

Clastic metasediments are mainly developed in the southwestern part of the map-area in association with mafic metavolcanics and with the prominent interbanded chert-magnetite ironstones.

The metasediments in the southwest are mainly arkose and wacke containing a large component of volcanic material. These rocks lie in the fringe area between *sensu stricto* sediments and volcanics. These rocks are generally fine-grained and laminated or finely bedded. Thin section examination reveals that these rocks, like the felsic tuffs, display a granoblastic texture and retain some variations in grain size. Graded bedding, however, is not retained.

The mineral assemblage of the arkose is: biotite (25 percent), plagioclase (55 percent), and quartz (20 percent). The plagioclase has a composition of An_{18} (andesine). In the wacke, almandine garnet is occasionally present (Photo 6) with biotite and quartz. This represents a typical assemblage of pelitic rocks of amphibolite facies metamorphic rank. Alumino-silicates have not been recorded in pelitic assemblages from the map-area.

The conglomerates are spatially restricted to outcrops near "Noranda Lake" (lake north of Beaver Lake) and contain well-rounded clasts about 2 to 20 cm in diameter. Essentially monomictic, the dominant clast type is a mafic volcanic (amphibolite), and the matrix contains about 1 to 10 percent carbonate.

TABLE 3 CHEMICAL ANALYSES OF MAFIC TO INTERMEDIATE AND FELSIC METAVOLCANICS IN THE MATCHINAMEIGUS LAKE AREA.

Sample Number	20	22	10	1	13	17	16	15	14
Major Components in Weight Percent									
SiO_2	58.6	60.9	62.2	65.6	66.0	67.6	67.8	71.4	75.1
Al_2O_3	15.5	15.4	15.9	16.4	15.9	17.5	17.2	15.0	14.0
Fe_2O_3	7.50	8.10	6.10	4.25	4.44	1.42	1.18	3.32	0.62
MgO	4.70	2.83	2.30	0.95	1.02	0.59	0.40	0.43	0.00
CaO	6.8	5.4	6.7	2.67	4.86	2.32	1.87	2.59	0.85
Na_2O	3.53	5.01	4.16	6.26	2.19	7.36	7.51	2.64	6.75
K_2O	0.60	0.10	0.17	0.39	1.64	0.47	1.03	1.90	0.09
TiO_2	0.78	1.17	0.66	0.45	0.28	0.25	0.20	0.36	0.15
P_2O_5	0.13	0.19	0.13	0.08	0.01	0.05	0.05	0.03	0.00
MnO	0.11	0.09	0.09	0.07	0.07	0.03	0.02	0.06	0.01
L.O.I.	1.8	0.5	0.3	1.3	1.7	1.0	0.7	1.0	0.4
Total	100.0	99.7	98.7	98.3	98.1	98.6	98.0	98.7	98.0
CO_2	0.06	0.12	0.20	0.27	1.46	0.15	0.09	0.15	0.17
S	0.12	0.01	0.01	0.01	0.05	0.01	0.02	0.04	0.03
Normative Mineralogy in Weight Percent									
Apatite	0.031	0.45	0.31	0.19	0.02	0.12	0.12	0.07	0.02
Pyrrhotite	0.34	0.03	0.03	0.03	0.14	0.03	0.06	0.11	0.08
Ilmenite	1.52	2.25	1.23	0.88	0.55	0.02	—0.05	0.70	—0.12
Orthoclase	3.63	0.60	1.03	2.38	10.09	2.85	6.26	11.51	0.55
Albite	30.54	42.98	35.91	54.72	19.27	63.81	65.32	22.89	58.51
Anorthite	25.24	19.51	24.71	13.14	25.00	11.46	9.20	12.96	4.25
Corundum	—	—	—	1.05	1.78	0.81	0.46	4.06	1.31
Acmite	—	—	—	—	—	—	—	—	—
Magnetite	3.38	3.93	3.20	2.92	2.68	—	—	2.76	—
Hematite	—	—	—	—	—	1.46	1.21	—	0.64
Wollastonite	—	—	—	—	—	—	—	—	—
Enstatite	9.64	5.68	3.89	2.44	2.64	1.51	1.02	1.10	0.03
Ferrosilite	4.19	4.00	2.59	1.59	2.48	—	—	0.23	—
Quartz	14.29	15.47	20.42	20.65	35.34	17.71	16.15	43.60	34.52
Diopside	5.03	3.16	4.21	—	—	—	—	—	—
Forsterite	—	—	—	—	—	—	—	—	—
Fayalite	—	—	—	—	—	—	—	—	—
Nepheline	—	—	—	—	—	—	—	—	—
Leucite	—	—	—	—	—	—	—	—	—
Kaliophilite	—	—	—	—	—	—	—	—	—
Hedenbergite	1.90	1.94	2.44	—	—	—	—	—	—
Cancrinite	—	—	—	—	—	—	—	—	—
Rutile	—	—	—	—	—	0.25	0.23	—	0.22
TOTAL	100.01	100.00	99.97	99.99	99.99	100.03	99.98	99.99	100.01

Note: Chemical analyses performed by Geoscience Laboratories, Ontario Geological Survey, Toronto.

TABLE 4 | CHEMICAL ANALYSES OF MISCELLANEOUS ROCK TYPES IN THE MATCHINAMEIGUS LAKE AREA.

Major Components in Weight Percent

Sample Number	9	21	3
SiO_2	31.5	57.?	56.8
Al_2O_3	3.0	15.6	15.6
Fe_2O_3	20.2	9.6	9.7
MgO	25.8	2.5	4.1
CaO	5.71	4.75	5.12
Na_2O	0.11	4.24	3.05
K_2O	0.51	0.97	2.18
TiO_2	5.02	1.41	0.92
P_2O_5	0.14	0.29	0.15
MnO	0.26	0.14	0.15
L.O.I.	7.5	0.40	1.65
Total	99.8	99.6	99.5
CO_2	0.83	0.07	0.30
S	0.14	0.17	0.05

Normative Mineralogy in Weight Percent

Apatite	0.36	0.68	0.36
Pyrrhotite	0.42	0.47	0.14
Ilmenite	10.48	2.72	1.80
Orthoclase	—	5.82	13.28
Albite	—	36.38	26.57
Anorthite	6.89	20.96	23.10
Corundum	—	—	—
Acmite	—	—	—
Magnetite	10.39	4.28	3.61
Hematite	—	—	—
Wollastonite	—	—	—
Enstatite	—	6.20	10.16
Ferrosilite	—	5.69	8.51
Quartz	—	15.97	10.80
Diopsite	13.47	0.46	0.97
Forsterite	45.11	—	—
Fayalite	6.84	—	—
Nepheline	0.55	—	—
Leucite	2.60	—	—
Kaliophilite	—	—	—
Hedenbergite	1.62	0.37	0.71
Cancrinite	—	—	—
Rutile	—	—	—
Larnite	1.23	—	—
TOTAL	99.96	100.00	100.01

Note that in these analyses the total is taken from L.O.I. without CO_2 and S. The value of H_2O+ cannot be computed from L.O.I. because FeO was not analyzed. Hence CO_2 and S are listed following the total.

Note: Chemical analyses performed by Geoscience Laboratories, Ontario Geological Survey, Toronto.

TABLE 5 | QUALITATIVE SPECTROGRAPHIC ANALYSES OF SAMPLES FROM THE MATCHINAMEIGUS LAKE AREA.

	24	26	23	25	27	28	29	30
Cr	—	—	—	—	—	TL(1000)	T	T
Co	—	—	T	—	—	—	—	—
Cu	—	T	T	T	T	T(178)	TL(375)	T
Pb	T	—	—	—	—	—	—	—
Mn	—	TL	TL	TL	TL	TL	TL	T
Ni	—	—	T	—	—	TL(650)	—	—
Ti	—	LM	LM	L	L	LM	LM	TL
V	—	—	T	T	T	T	T	—
Zn	—	T	T	T	T	T	T	T
Fe	L	H	H	MH	MH	MH	M	LM
Au (ppb)	—	—	20	20	10	10	40	10
Pt	—	—	N.D.	—	—	—	—	—

Qualitative Spectrographic analyses included, in addition to those elements shown in the table, Sb, As, Be, Bi, Cd, Ce, Ge, Li, Hg, Mo, Nb, Ag, Ta, Te, Th, Sn, U, Y, Zr, all of which were not detected.
T = 0.01 to 0.10%; TL = 0.05 to 0.50%; L = 0.1 to 1.0%; LM = 0.5 to 5.0%; M = 1 to 10%; MH = 5 to 15%; H = 10 to 100%; Numbers in brackets indicate a separate assay value, in ppm.

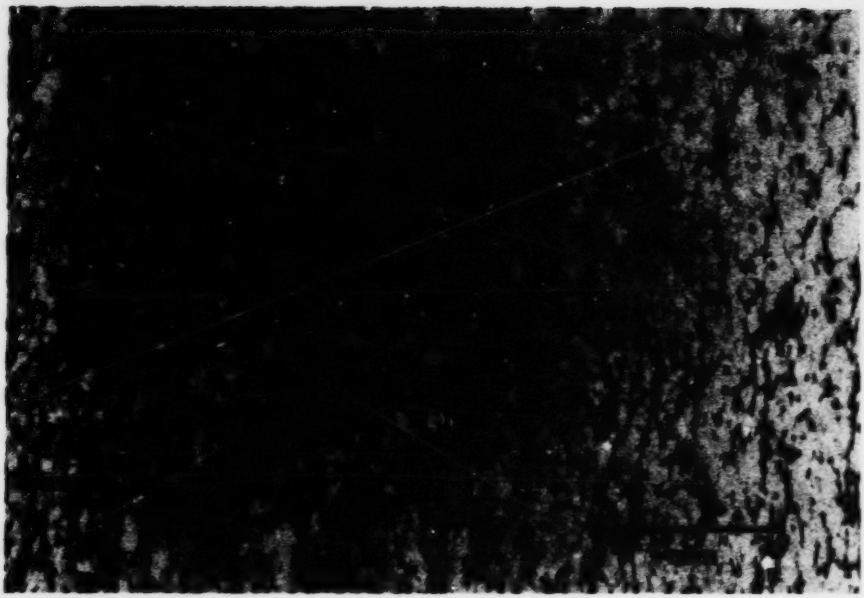
Note: Chemical analyses performed by Geoscience Laboratories, Ontario Geological Survey, Toronto.

TABLE 6 | ASSAY RESULTS, MATCHINAMEIGUS LAKE AREA.

28		29	
Cu	178	Cu	375
Ni	650		
Cr	1000		

values in ppm

Assays performed by Geoscience Laboratories, Ontario Geological Survey, Toronto.



OGS 10 566

Photo 6–Photomicrograph of wacke metasediment composed of biotite and quartz with minor almandine garnet (plane light).

Chemical Metasediments

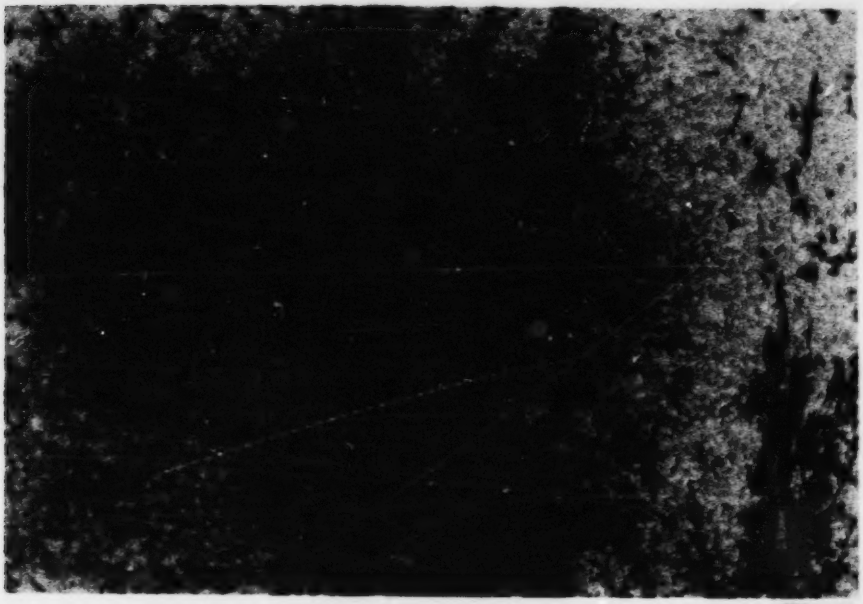
Interbanded chert and magnetite ironstone form the main chemical metasediments in the map-area. The unit is composed of interbanded sucrosic quartz layers and medium-grained magnetite layers, each about 5 to 10 mm thick with occasional disseminated pyrite and pyrrhotite, and traces of chalcopyrite and sphalerite. Where best developed, one such unit is 15 m thick, but commonly observed widths are less than 10 m.

In one sample of chert containing sparse euhedral magnetite crystals, grunerite has been identified in thin section (Photo 7). In the Proterozoic iron formations of the Labrador Trough, Klein (1978) observed that grunerite begins to form at the biotite isograd.

Magnetite ironstone was found in association with wacke, mafic tuff, and within felsic volcanic tuff.

The tuffs contain minor thin magnetite ironstone-quartz-(chert) bearing units about 10 cm to 1 m thick associated with sucrosic quartz (chert) and epidote pods 1 cm by 30 cm.

A dolostone unit which is located next to "Noranda Lake" [author's name for lake north of Beaver Lake], can be assigned to either the chemical metasedi-



OGS 10 567

Photo 7–Photomicrograph of chert containing acicular grunerite (Gr) associated with large euhedral magnetite crystals (Mag) (plane light).

OGS 10 568

Photo 8–Foliated dolostone unit on "Noranda Lake" (lake north of Beaver Lake).

OGS 10 589

Photo 9–Photomicrograph of dolostone unit. Showing the granoblastic dolomite with sparse tremolite (plane light).

ments or the clastic metasediments. It occurs within the mixed metasediment-metavolcanic pile in the southwest part of the map-area, and is exposed over a strike length of 1500 m and is 50 to 100 m in thickness. This unit is buff to rusty brown on the weathered surface and cream to buff on the fresh surface, consisting of sucrosic fine- to medium-grained dolomite with sporadic development of tremolite-actinolite and thin (< 1 mm) stringers of calcite. This unit appears to be a normal bedded metasedimentary carbonate, rather than a carbonatized flow as has been recorded in diamond-drill logs from the area (Photos 8 and 9, and Assessment Files Research Office, Ontario Geological Survey, Toronto). Analyses of a sample of this unit indicate Cr and Ni values of less than 10 ppm and less than 100 ppm respectively (Table 7). Both these values would appear to be too low if the rock were carbonatized mafic to intermediate volcanics. A partial analyses (Table 7) of one sample gave 24.7 percent Ca, 9.95 percent Mg, and 2.25 percent Fe. This recalculates to 21.56 percent calcite and 78.43 percent dolomite, without taking into account the Fe. A stained section of this rock (Sample D-49-1) gave modal amounts (Table 9) of 84.7 percent dolomite and 9.7 percent calcite in a granoblastic matrix, with 5.3 percent calcite filling veinlets.

TABLE 7 | PARTIAL CHEMICAL ANALYSIS OF CARBONATE, MATCHINAMEIGUS LAKE AREA.

	31
Ca	24.7%
Mg	9.95%
Fe	2.25%
Cr	less than 10 ppm
Ni	trace, less than 100 ppm

Partial analysis by Geoscience Laboratories, Ontario Geological Survey, Toronto.

MAFIC INTRUSIVE ROCKS

Foliated gabbros occur within the basal part of the mafic metavolcanics in the northern part of the map-area and correlate with a low to moderate response on the aeromagnetic map (Ontario Department of Mines - Geological Survey of Canada 1962).

Outcrops of this unit, are foliated to massive, and are characterized by the presence of discrete and equant hornblende crystals approximately 2 to 4 mm in diameter. Typical assemblages are amphibole-epidote-quartz-opaque minerals and sphene. The unit is slightly magnetic in hand specimen in contrast to the non-magnetic character of the mafic metavolcanics. The aeromagnetic response of this unit is non-magnetic in character.

FELSIC INTRUSIVE ROCKS

Early Felsic Intrusive Rocks[1]

These rocks are dominantly trondhjemites (Table 9) containing about 50 percent plagioclase of oligoclase composition, 20 to 40 percent quartz, and variable amounts of biotite and/or hornblende. The rocks are medium grained, and are grey to buff on the weathered surface. Potassic feldspar is notably absent and gneissic banding is a common textural feature. Much of Echum Township is underlain by these trondhjemitic gneisses. Most of the variations that occur within these rocks can be seen in road cuts along Highway 651.

[1]Classification used according to L.D. Ayres (1972).

TABLE 8 | **LOCATIONS AND DESCRIPTIONS OF CHEMICALLY ANALYZED SAMPLES, MATCHINAMEIGUS LAKE AREA.**

For Whole rock analyses — major elements

Sample	Latitude	Longitude	Chemical rock name (using Jensen classification)
1	48.17583	84.13750	Calc-alkalic dacite high Al.
2	48.17972	84.13944	Tholeiitic basalt
3	48.17944	84.11694	Calc-alkalic andesite, high Al. (mafic tuffwacke metasediment)
4	48.18194	84.11611	Hawaiite - metasomatised tholeiitic basalt
5	48.17000	84.14056	Alkalic picritic basalt
6	48.17111	84.14111	Tholeiitic basalt high Al.
7	48.17222	84.14167	Tholeiitic basalt
8	48.17444	84.14361	Calc-alkalic andesite high Al.
9	48.17750	84.13861	Mica peridotite dike (serpentinized and of kimberlitic affinity)
10	48.16972	84.10167	Calc-alkalic andesite high Al.
11	48.17000	84.09333	Tholeiitic basalt
12	48.17528	84.09333	Tholeiitic basalt
13	48.14528	84.12583	Calc-alkalic andesite high Al.
14	48.14528	84.12583	Calc-alkalic rhyolite
15	48.14500	84.12472	Tholeiitic dacite
16	48.14694	84.12861	Calc-alkalic rhyolite high Al.
17	48.14722	84.12889	Calc-alkalic rhyolite high Al.
18	48.14528	84.12417	Calc-alkalic andesite high Al.
19	48.13556	84.12583	Tholeiitic andesite
20	48.18333	84.27000	Calc-alkalic andesite
21	48.18806	84.27028	Diabase dike-chilled margin (tholeiitic andesite)
22	48.19167	84.25861	Calc-alkalic andesite

For spectrographic and partial analyses, including assays:

23	48.18583	84.07806	Pyroxenite containing pyrite and magnetite
24	48.14817	84.14028	Vein quartz from Longhurst gold showing
25	48.17722	84.16333	Metagabbro containing pyrite and trace chalcopyrite
26	48.17694	84.14722	Metasediment containing 10 percent pyrite gossan zone
27	48.18472	84.16500	Mafic metavolcanic, minor amount of silicification. Some magnetite
28	48.12750	84.23417	Amphibolite containing pyrrhotite trace
29	48.13389	84.23167	Metachert containing finely disseminated pyrite and trace chalcopyrite
30	48.09333	84.18722	Felsic volcanic with fine disseminated pyrite. From Gossan
31	48.11500	84.22444	Dolostone.

Along the section of highway south of Shikwamkwa Lake, hornblende and biotite-rich trondhjemite gneisses can be observed. These rocks consist of homogeneous and inhomogeneous diatexites, with minor amounts of a leucocratic quartz-feldspar-muscovite mobilizate. In the section just south of Hand Lake, the quartz-feldspar biotite schists/gneisses probably represent a metasedimentary paleosome. Toward the contact of the early felsic intrusive rocks with the supracrustals along this same section of Highway 651 is a zone of hybrid diorite and agmatitic migmatite (*see* Map 2483). This hybrid zone can be traced along much of the eastern border of the supracrustal belt, and is commonly about 100 to 300 m wide. The diorite is dark grey, foliated, and medium grained. Hornblende (45 percent), plagioclase (45 percent) of andesine composition, epidote (7 percent), biotite (3 percent) and trace amounts of quartz are the main constituents of the rock (Table 9).

Diorite of this type is also found in an area between Hand Lake and Richardson Lake. It is possible that the boundary of this body extends further to the west because outcrops of metavolcanics on the northeast side of Richardson Lake show schollen structures (Mehnert 1971) which are similar to a schlieren-type structure in migmatites of a border phase (Photo 10). Rafts of remnant mafic metavolcanics occur in a medium-grained diorite matrix. These rafts are 0.5 to 1 m in length and 5 to 20 cm in width. This migmatite zone is related more to the dioritic mass to the east than to the stock composed of quartz-monzonite, and granodiorite exposed to the north.

Late Felsic Intrusive Rocks

These rocks form two main bodies; one on the northern border of the supracrustals and one in the southwest. The northernmost body is a massive, non-foliated granodiorite composed of about 50 percent plagioclase (of oligoclase to andesine composition), 10 percent microcline and 20 percent quartz, with the remainder being made up of epidote, biotite, sericite and sphene (Table 9). The potassic feldspar content is variable due to the development of large (up to 3 cm) poikiloblastic crystals. Small, doubly terminated β quartz crystals can be seen in hand specimen and thin section.

This granodioritic body is remarkably homogeneous in composition and texture.

The southwestern body is a medium-grained and massive to faintly foliated quartz monzonite. The rock appears pinkish on both weathered and fresh surfaces, and consists of quartz, plagioclase (oligoclase), microcline, and minor biotite (Table 9). A characteristic of this body is the presence of up to 0.5 percent allanite (Photo 11).

TABLE 9 | **MODAL ANALYSES OF SELECTED ROCKS FROM THE MATCHINAMEIGUS LAKE AREA.**

Mafic Metavolcanics

6	Mafic flow
Hornblende	66.4%
Plagioclase	23.3%
Epidote	9.5%
Sericite	0.2%
Opaque Minerals	0.6%
Quartz	trace

Plagioclase is An_{46}

4 (metasomatised near granodiorite)	Mafic flow
Epidote	35.8%
Hornblende	28.8%
Saussurite	10.6%
Plagioclase	14.4%
Microcline	5.6%
Opaque Minerals	1.4%
Sericite	3.4%

Intermediate Metavolcanics

1	Dacitic Tuff
Quartz	34.2%
Plagioclase	30.2%
Epidote	16.0%
Sericite	10.4%
Chlorite	6.6%
Opaques	2.6%

13	Andesitic Tuff
Quartz	40.5%
Plagioclase	6.6%
Sericite	9.6%
Epidote	32.5%
Chlorite	10.6%
Opaques	0.2%

Felsic Metavolcanics

17	Rhyolitic Tuff
Quartz	11.0%
Plagioclase	75.2%
Sericite	8.6%
K-feldspar	1.8%
Epidote	3.4%

Metasediments: — Dolostone

32	Dolostone
Calcite	3.0%
Dolomite	80.7%
Tremolite	11.7%
Chlorite	0.6%
Calcite in veinlets	4.0%

(stained section)

31	Dolostone
Calcite	9.7%
Dolomite	84.7%
Opaques	0.3%
Calcite in veinlets	5.3%

(stained section)

Felsic Metamorphic and Intrusive Rocks

33	Trondhjemite
Plagioclase	51.1%
Quartz	26.1%
Biotite	10.1%
Hornblende	9.1%
Epidote	2.2%
Opaques	1.4%
Apatite	trace

Plagioclase is An_{28} (oligoclase)

34	Diorite (Border phase)
Hornblende	44.0%
Plagioclase	43.9%
Chlorite	3.5%
Epidote	7.4%
Opaques	0.1%
Sphene	1.1%

Plagioclase is An_{33} (andesine)

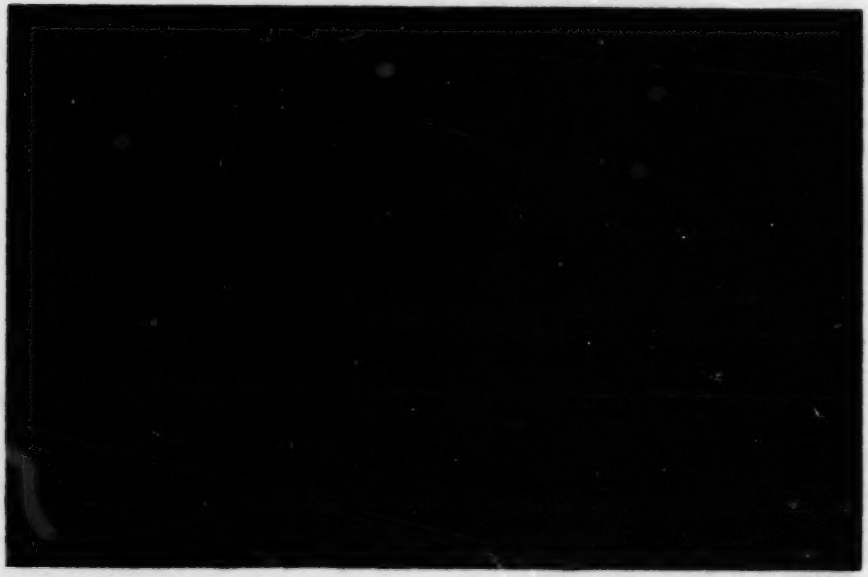
TABLE 9 – continued

35 Quartz monzonite (Southwestern body)		36 Granodiorite (Northwestern body)	
K-feldspar	35.1%	Plagioclase	53.4%
Plagioclase	28.3%	K-feldspar	11.4%
Quartz	30.7%	Quartz	22.1%
Biotite	5.5%	Epidote	6.4%
Allanite (with epidote)	0.4%	Biotite	2.7%
		Sericite	3.6%
Plagioclase is An25 oligoclase		Plagioclase is An28 to 32	
		K-feldspar/Total Feldspar =	17%

Late Precambrian — Ultramafic Intrusive

37 Lamprophyric dike of kimberlitic affinity

Olivine (incl. serpentine) (phenocrysts)		38.0%
groundmass	Clinopyroxene	21.4%
	Phlogopite	23.7%
	Opaques	13.1%
	Perovskite	3.2%
	Carbonate	0.6%



GSB 19 870

Photo 10–Schollen texture in rocks on Richardson Lake. The clasts are of mafic metavolcanics and the matrix a medium- to coarse-grained diorite.

OGS 10 571

Photo 11–Photomicrograph of allanite (Al) rimmed by epidote (Ep), a typical accessory mineral to the southwestern quartz monzonite stock (plane light).

Middle Precambrian

ULTRAMAFIC TO MAFIC INTRUSIVE ROCKS

Coarse-grained pyroxenite and lamprophyre occur as plugs, each approximately 0.5 km in diameter and also occurs as an arcuate dike in the map-area. These rocks are dark green to black on the fresh surface and are composed of hornblende and augite. A common textural feature is an intergrowth, or mottled texture of augite and hornblende, which probably represents a prograde degradation of the augite. Some parts of these stocks contain minor developments of a mica peridotite, where the present assemblage is magnetite with tremolite and serpentine (probably replacing olivine), together with coarse-grained phlogopite.

A sample of biotite pyroxenite from Echum Township, from a roadside outcrop on the plug just north of Hand Lake, has been dated by K-Ar techniques and gives two ages, 2374 ± 136 and 2320 ± 135 Ma (Sample AJ1-5A, located at Latitude 48°11'00", Longitude 84°04'25"; K. Bell, Geologist, Geological Survey of Canada, personal communication, 1980). Most of the pyroxenites are

strongly magnetic and give moderate to intense magnetic highs on the aeromagnetic map (Ontario Department of Mines-Geological Survey of Canada 1962). A previous analysis performed by the Department of Mines Laboratories, gave assay values of 0.14 percent Cu and 0.02 percent Ni for a biotitic pyroxenite which contained disseminated sulphides (R. Sage, Geologist with the Ontario Geological Survey, personal communication, 1980). A sample of biotite pyroxenite, collected by the present survey (sample 23) was submitted for spectrographic analysis, and the results are shown in Table 5. Note that the value of Au is 20 ppb and platinum was not detected.

Late Precambrian

MAFIC INTRUSIVE ROCKS

These are the ubiquitous diabase dikes that vary from quartz diabase to porphyritic diabase with glomeroporphyritic crystals of white to green plagioclase. Thin section examination reveals typical ophitic textures of the plagioclase (generally of labradorite composition) and a groundmass of plagioclase, clinopyroxene, and opaque minerals. The analysis (Table 4) of the chilled margin (aphyric) of a diabase dike is plotted on the AFM (*see* Figure 2)and Jensen Cation plots (*see* Figure 3, sample number 0-22-17). Note that it falls just into the tholeiitic dacite field. Two main sets of dikes exist in the map-area; the principal set trends N20°W and a minor set trends northeast to east-northeast. By comparison to the adjoining area to the east, Chapleau Area (Thurston *et al.* 1977) it would appear that the north-northwest trending set could be assigned to the MacKenzie Swarm which has an age of about 1660 Ma. The northeast to east-northeast trending set could be assigned to the Abitibi Swarm which has an age of about 1230 Ma. Both of these sets show up well on the aerial photographs of the area, but not on the aeromagnetic map (Ontario Department of Mines - Geological Survey of Canada 1962).

ULTRAMAFIC INTRUSIVE ROCKS

Two dike rocks were found in the map-area, and have mineral assemblages which approach those of a kimberlite (Photos 12 and 13). These dike rocks are sufficiently different to the other lamprophyres exposed in the area as to set them apart for separate mention. Each dike is about 1 m wide.

One dike on the east shore of Lake 'A' [author's name for lake 2 km east of the 4 mile post on the western boundary of Dolson Township] (sample D535, Table 9) contains euhedral fresh olivine phenocrysts, with a panidiomorphic texture, which are partly serpentinized along cracks (probable autometasomatism). It has a groundmass of phlogopite, an acicular clinopyroxene, euhedral octahedrons of perovskite, opaque minerals (probably magnetite and ilmenite) and minor to trace carbonate (Table 9). The rock is black on the fresh surface

OGS 10 572

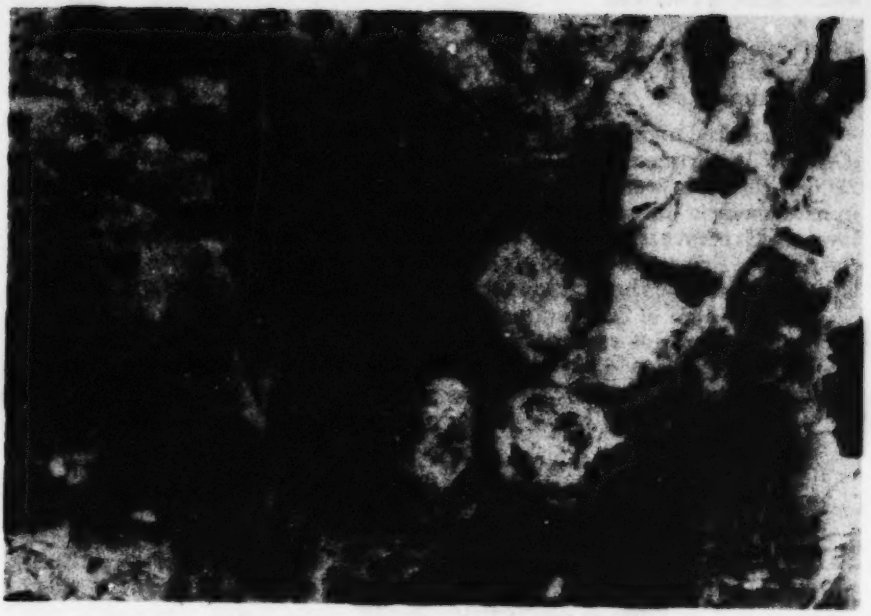
Photo 12–Photomicrograph of lamprophyre with kimberlitic affinity. Note the panidiomorphic texture of fresh euhedral olivine phenocrysts (plane light).

and brown on the weathered surface. The olivine phenocrysts which weather out as paler than the ground mass, vary in size from about 0.1 mm to 2 mm.

The assemblage lacks the pyrope which is regarded by Dawson (1967) as an essential constituent of a kimberlite, and the presence of clinopyroxene is also not typical of kimberlites *sensu stricto*. However, it is texturally and mineralogically similar to the Bachelor Lake 'kimberlite' (Watson 1955). This has been dated at 1100 Ma (Watson 1955), and may have some correlation with the "Kapuskasing High".

The dike in question may be as young as Upper Jurassic to Early Cretaceous when considering other occurrences of kimberlites in the region. For example the micaceous kimberlite in the Upper Canada Mine in Gauthier Township, Ontario, has an age date of 151 Ma (Lee and Lawrence 1968) and the kimberlitic dike at Coral Rapids on the Abitibi River has been assigned a Post-Devonian age (Bennett *et al.* 1967).

The second "kimberlitic" dike rock in the map-area, sample number 9 (Table 4), is located on the main turn in the road west of Ballard Lake and is a micaceous peridotite. This rock consists of serpentinized olivine, and minor phlogopite. The euhedral outlines of olivine are clearly visible, but no fresh olivine is present. Magnetite occurs as a fine dusting throughout the serpentine, and as discrete grains throughout the rock.



OGS 10 573

Photo 13–Photomicrograph of lamprophyre (same as photo 12) showing groundmass assemblage of olivine (ol), clinopyroxene (cpx), and perovskite (per).

Cenozoic

QUATERNARY

Pleistocene and Recent

The Pleistocene geology of the Algoma area has been previously mapped on a reconnaissance scale by Boissonneau (1965). Observed glacial striae indicate that ice movement was towards S20°W. Glacial overburden is very variable in thickness, and covers most of the area. Several small sized eskers cross the area from north-northeast to south-southwest. These are composed of large boulders, cobbles, and sand of mixed origin.

In the Dalton Mills area of Echum Township, sands and gravels are moderately thick. Observed depths in pits are up to 20 m. This area is marked by stippling on Map 2483, back pocket. A similar area of sands occurs along the Shikwamkwa River.

CORRELATION OF GEOLOGY WITH AEROMAGNETIC DATA

Pronounced high magnetic anomalies on the aeromagnetic map of the area (Ontario Department of Mines - Geological Survey of Canada 1962; Map 2206G) correlate well with ironstone units and with pyroxenitic plugs. The ironstones form linear anomalies of up to 900 gammas above the background level which occurs mainly over the metavolcanics. The pyroxenitic intrusion in the north of Echum Township gives a value of 2200 gammas above background. Other smaller plugs have values around 300 gammas above background.

A broad high of 300 gammas above background is found over the metagabbro. Comparative values and patterns over the granitoid gneisses and metavolcanic sequence do not allow a distinction to be made between these sequences using aeromagnetic data.

STRUCTURAL GEOLOGY AND STRATIGRAPHY

The metavolcanics and metasediments form a southeast-northwest-trending synclinal belt, the axial trace of which has the configuration of a "V" closing to the south. The western arm is 12 km across, whilst the eastern arm is only 3 km wide. The greater width in the west is interpreted by the author to be due to the presence of an additional and earlier volcanic cycle not present on the eastern limb. This cycle is characterized by a higher proportion of clastic metasediments than in the rest of the belt, and comprises tuff, reworked tuff, and wacke containing a high proportion of volcanically-derived material. Additionally, the dolostone unit occurs in the middle stages of the cycle, and the amount of felsic volcanism is minor.

The principal progression in the upper volcanic cycle is one of high-iron tholeiitic basalt and andesite at the base, to wacke-type metasediments with tuffs and magnetite ironstone - metachert units in the middle, and finally to calc-alkalic, andesite, dacite, and rhyolite in the upper part. This upper cycle is interpreted by the author to be repeated about a major synclinal axis, which is best represented in the area just west of Matchinameigus Lake. Sparse 'top' information supports this structural interpretation.

The ironstone-bearing unit occurs at the stratigraphic contact of mafic metavolcanics and overlying metasediments with felsic intermediate metavolcanics on the southern limb. A very weak magnetic expression on the northern limb is interpreted by the author to indicate the presence of an equivalent unit at the same stratigraphic level. Two previously unrecorded gossan zones with sulphide mineralization occur along this unit in the northern part of the map-area (*see* Map 2483, back pocket).

The ironstone unit flanking the eastern edge of the supracrustals is a problem. At its northern end, the unit occurs in the stratigraphic sequence mentioned previously. To the south, and along the edge of Manton Lake, however, the unit is associated with metasediments. Mafic metavolcanics occur both above and below the unit.

Several lineaments, some of which define faults in the area, trend N45°E

and north. A northeast-trending fault extending along Murray Creek in Dolson Township [not located on map] appears to have a horizontal displacement of between 100 and 300 m. North-trending faults observed in the Noranda Lake area appear to have small, associated displacements.

ECONOMIC GEOLOGY

Description of Properties and Occurrences

Work done on the properties is summarized in Table 10. Apart from three claims currently held by G. Longhurst, all of the ground in the map-area is open for staking. All of the claims referred to in the following section, have been allowed to lapse.

BELMINE EXPLORATION LIMITED [1956] (1)

During 1956, Belmine Exploration Limited carried out work concurrently in two different areas within Dolson Township.

A resistivity survey (SSM 236) covered an area of nine claims (area 5) along 12.8 line km with a grid spacing of 120 m and stations every 30 m with no significant results, the company concluded that no massive sulphide mineralization existed within 30 to 60 m of the surface. The area staked consisted of nine claims numbered SSM 39023 to 39028; and SSM 39032 to 39034 inclusive, all these claims have been allowed to lapse.

Five diamond-drill holes (in area 6) totalling 620.5 m in length were put down over a zone 700 feet long (SSM 236). Holes were: B-1, 397 feet long; B-2, 571 feet long; B-3, 407 feet long; B-4, 400.4 feet long; and B-5, 260 feet long. Interbanded magnetite ironstone and quartz (chert) was the main unit intersected; the first two feet of which contained traces of sphalerite and chalcopyrite. A thin 4-inch long core section of massive pyrrhotite contained traces of sphalerite and chalcopyrite; no Ni was detected over a length of 2.5 feet.

No significant mineralization was intersected. The area staked consisted of nine claims numbered 41100-02-07-08, 41110-11-13-14, and 41094 inclusive. These claims have all been allowed to lapse.

CORDELL GOLD MINES LIMITED [1952] (2)

In a report for Cordell Gold Mines Limited [SSM 1816], R.G. Moiles, 1952, described a quartz vein containing scheelite. The vein strikes N 85°W and dips 80°N, has a reported strike length of 150 feet and a maximum width of 16 feet. It is described as containing glassy quartz and tourmaline, and occurs along the metavolcanic rock, diorite contact. Scheelite was identified using ultraviolet

TABLE 10 PROPERTIES AND OCCURRENCES IN THE MATCHINAMEIGUS LAKE AREA.

Name	TP.	No. on Map	Minerals Commodity	Latitude	Longitude	Type of Work	Area Line KM.	D.D.H's	Date	SSM No.	Remarks
Algoma Central Railway	E.D.	—				GL	Whole Twp.		1962	SSM 852 SSM 926 SSM 84 SSM 851	
Belmine Exploration Ltd. (1956)	D	1		48°08'30"	84°10'00"	gEM	12.8 line km (8)		Sep. 1956	SSM 236	Not same area but work done concurrently
				48°08'00"	84°10'00"	DD		5/610.8 (2035.9)	m Sep. 1956	SSM 236	
Cordell Gold Mines Ltd.	E	2	W, (Scheelite) Au	48°10'30"	84°03'30"	GL			Oct. 1952	SSM 1816	*Note - report of drilling having been done on this property for Au - no record
Frobisher Ltd. (1957) optioned by Hopkins Group Hopkins Explorations	D,E	3				ARA. AEM AMG/ gEM	58km2 316 line km 15 line km		1955/56	SSM 238	
				48°09'15"	84°12'00"	DD,GL		7/900 (3000)	Mar. 1956	SSM 237	
				48°07'30"	84°14'00"	DD TR		7/327 (1089.5)	Jan-Mar 1957	SSM 238	
Longhurst, G.	E	5	Au, Ag	48°11'00"	84°08'00"	TR; S;			1973	SSM 1696	
MacFie Explorations Ltd.(1955)	D	6	Cu, Ni	48°07'00"	84°14'00"	DD		5/276 (920.7)	1955?	SSM 239	

Miller, H.J. (1970)	E	7	Cu	48°10'45" 84°04'30"	TR			1970	SSM 1607	
Multi-Minerals Ltd. (1966)	D	8		48°07'30" 84°14'00"	DD		4/80.4 (268)	Sept.-Oct. 1966	SSM 1130	
The Ontario Syndicate (1971)	D,E	9			AEM AMG	1891 line km 48 km^2		July 1970	SSM 1639	
				48°08'15" 84°10'30"	gEM input gMG	13.9 line km (8.7)	*Recommended test hole but no drilling done	Mar. 1971	SSM 1639	*Anomalies coincident EM/-MG over same area as BEL-MINE-236 Geophys. & drilling
Talisman Mines Ltd. (1968)	D	10		48°09'00" 84°16'00"				1968	SSM 1326	Reassessment of SSM 238 work. No ground work done.

ABBREVIATIONS

Under TP:
E — Echum
D — Dolson

Under Type of Work:
AEM — Airborne electromagnetic survey
AMG — Airborne magnetic survey
ARA — Airborne radiometric survey
DD — Diamond drilling
GL — Geological survey
GEM — Ground electromagnetic survey
S — Sampling
TR — Trenching

light, but no samples were assayed. There is mention in the report of diamond-drilling having been done on this property for gold, but no record of this exists in the assessment files. The location is described as being 1,100 feet southwest of the Canadian Pacific Rail track near the shore of Hand Lake, but could not be located by the present survey party.

The property is no longer in good standing and consisted of nine claims numbered SSM 22675 to 22683 inclusive and covered 360 acres.

FROBISHER LIMITED [1957] (3)

Most of the property work filed under Frobisher Limited was done by Hopkins Exploration Consultants Limited. In 1955, an airborne electromagnetic and magnetic survey over an area of 58 km^2 with 1000 feet line spacing and 500 feet terrain clearance was conducted by Aeromagnetic Surveys Limited for Hopkins Exploration Consultants Limited (SSM 238). Diamond-drill targets were located with a ground electromagnetic survey conducted by McPhar Geophysics Limited for the company in 1956 (unspecified area and type of EM *see* SSM 238). The airborne survey of 1955 also included a gamma radiation detector, but did not disclose any radioactivity of significance (SSM 238).

The first period of diamond drilling in 1956 consisted of seven holes in central Dolson Township totalling 3000 feet (SSM 237) in length, as follows: Hole 1 - 498 feet; 2 - 453 feet; 3 - 349 feet; 4 - 562 feet; 5 - 320 feet; 6 370 feet; and 7 - 443 feet. This diamond drilling covered a zone about 1 mile long and intersected mainly interbanded magnetite-ironstone quartz. This unit is about 8 feet thick with ½ inch bands and contains thin pyrrhotite bands, 1 to 3 inches in width, which occasionally contain traces of chalcopyrite. All diamond-drill holes were put down in mafic metavolcanics which contained variable amounts of wacke-type metasediments.

This property was formerly covered by seven claims numbered SSM 38999, and 39000-02-03-04-07-08 inclusive. All of these claims were allowed to lapse.

A second period of diamond drilling about 1.5 km due east of Boisey Lake (claim SSM 238) consisted of seven holes totalling 332.1 m in length as follows: hole 1 - 363.7 feet; 2 - 521 feet; 3 - 51 feet; 4 - 25 feet; 5 - 50 feet; 6 - 50 feet; and 7 - 28.8 feet. Most of these holes are short, but many intersected what had been logged as carbonatized lava. These are interpreted by the author as dolostones due to their proximity to dolostones in outcrop. Hole 1 intersected 140 feet, hole 2 - 160 feet, hole 4 - 18 feet, and hole 7 - 30 feet of carbonate. Holes 5 and 6 appear to be drilled along strike and down dip. The remaining holes or parts of the holes are in mafic to intermediate metavolcanics. The main conductors were zones of up to 80 percent pyrrhotite, (commonly 40 to 50 percent) within metavolcanics, containing traces of chalcopyrite, over a maximum width of 10 feet. No economic mineralization was reported.

Some trenching was done in 1960, but this did not encourage any further drilling.

This property was formerly covered by seven claims. The exact numbers of these are not known; they have all been allowed to lapse.

HAND LAKE OCCURRENCE (4)

A grab sample of a biotite pyroxenite (lamprophyre) on Highway 651 just north of Dalton Mills in Echum Township was previously assayed (R. Sage, Geologist, Ontario Geological Survey, personal communication, 1979). This returned values of 0.14 percent Cu and 0.01 percent Ni. A similar sample analyzed by emission spectrometry returned approximately 1000 ppm Cr and less than 1 ppm Ag (this sample, number AJ1-5A, has been dated by K-Ar techniques and gives an age of 2350 ± 135 Ma) (R. Sage, Geologist, Ontario Geologist Survey, personal communication, 1979).

In outcrop, this is a coarse-grained black to dark green pyroxenite with variable (5 to 50 percent) amounts of medium-grained biotite. Sulphide minerals, mainly pyrite and minor pyrrhotite amount to about 2 to 5 percent, and magnetite is present as a medium grained phase amounting to about 1 percent. The outcrop forms a more sulphide-rich part of a 'stock' which is about 1.6 km N-S by about 1.2 km E-W. No claims have been recorded to exist on this ground.

G. LONGHURST (5)

Trenching and power stripping in 1973 by J.P. Davies over a zone 21 by 60 by 5 feet endeavoured to uncover a gold-bearing quartz vein striking approximately northwest-southeast. The vein is located near the west shore of Ballard Lake in Echum Township. Reported assays of grab samples are as follows (SSM 1696): 3.20, 2.23, and 4.49 ounces of gold per ton; and 7.80, 7.37, and 12.91 ounces of silver per ton.

This was formerly claim SSM 329763 which had been allowed to lapse.

This ground is currently (March 1979) held by G. Longhurst under three claims SSM 469200 - 01-02 (formerly 430164, 430159 - 60). Assays of grab samples as disclosed by Mr. G. Longhurst (owner of the property, personal communication, 1979) are as follows: 0.22, 1.62, 0.95, 0.61, 0.17, and 0.68 ounce gold per ton and 0.42, 5.16, 8.22, 1.70, 0.56, and 1.90 ounce(s) silver per ton.

A sample of wall rock gave an assay of 0.01 ounce gold per ton and 0.03 ounce silver per ton.

A visit by the author revealed the following information:

1. The quartz vein is commonly 30 to 40 cm wide and strikes at N40°W to N30°W,
2. It was traced over a strike length of 1000 feet exposed in several pits and trenches.
3. Within the vein a white milky quartz contains variable (1 to 5 percent) amounts of pyrite and minor galena, but no visible gold. The wall-rock consists of mafic metavolcanics with 10 to 20 percent pyrite as discrete euhedral grains 1 to 2 mm in size.

This is presently covered by the three claims; SSM 469200-01-02 owned by G. Longhurst, current as of March, 1979.

MACFIE EXPLORATIONS LIMITED [1955] (6)

In 1955 MacFie Exploration Limited [SSM 239] diamond drilled five holes totalling 280.6 m in length within the metavolcanics in the south-central part of Dolson Township. This zone is just to the north of the area diamond drilled by the Hopkins Group. The length of the holes is as follows: A-1, 145 feet; A-3, 87.7 feet; B-1, 110 feet; B-2, 149 feet; and E-1, 429 feet. These holes intersect mainly mafic metavolcanics occurring in a north-south striking zone 1600 feet in length. From the brief logs that are available, it appears that mineralization consisting of pyrrhotite and pyrite was intersected, of which the best intersection assayed (SSM 239) 0.07 percent Cu, and 0.03 percent Ni over 6 feet.

No further work was recorded for this area. The company formerly held five claims (Numbers 35802 to 35807 inclusive) which have since been allowed to lapse.

H.J. MILLER [1970] (7)

In north-central Echum Township, just north of Hand Lake, an east-west trench was excavated 21 by 60 by 5 feet. No report exists of any mineralization being found. The area was visited by the author and found to consist of sands and gravels. Nearby bedrock consists of a biotite pyroxenite (lamprophyre). The preliminary map P.640 (Wawa Sheet) shows a copper property for this location. The source of this information is not known.

This area was covered by one claim numbered SSM 234066 which has since been allowed to lapse.

MULTI-MINERALS LIMITED [1966] (8)

In 1966 Multi-Minerals Limited diamond drilled four holes totalling 81.7 m in length in a zone close to that drilled by the Hopkins Group and just south of MacFie Exploration Limited's drilling. The structure of this area is somewhat complex as indicated from the mapping done by this survey, having predominantly shallow dips around 30°NE to E. Hole AW-1, (220 feet long) is completely within carbonates. The other three holes, AW-4, is 35 feet long; CW-1, is 72 feet long; and hole CW-2 is 141 feet long, are within mafic metavolcanics with some thin carbonate stringers. Some thin zones of mineralization consisting of disseminated pyrite and pyrrhotite were intersected mainly in the mafic metavolcanics. The best of these mineralized zones assayed 0.03 percent Cu and 0.01 percent Ni over a width of 5.5 feet and was described as a silicified section of mafic metavolcanics containing 3 to 4 percent pyrrhotite and fine blades of chalcopyrite, which, in one part, contained a 3-inch wide section of semi-massive pyrrhotite and fine chalcopyrite (SSM 1130).

No further work was done on this property and the claims were allowed to lapse.

THE ONTARIO SYNDICATE [1971] (9)

A combined magnetometer and input electromagnetic airborne survey was carried out by Questor Surveys Limited for The Ontario Syndicate in 1970 (area 16; SSM 1639) over a 48 km² area covering much of Echum and part of Dolson Townships. A line spacing of 1/8 mile and terrain clearance of 400 feet with the "bird" at 150 feet was used. Follow-up ground geophysics over a 14 claim area using vertical loop electromagnetic, and magnetometer methods delineated coincident magnetic and electromagnetic anomalies which were selected for drilling, but none were tested. This is in the same area as that diamond drilled by Belmine Exploration Limited (*see* SSM 236).

The claims were subsequently allowed to lapse.

TALISMAN MINES LIMITED [1968] (10)

In 1968, Talisman Mines Limited acquired a group of 14 contiguous claims from the Hopkins group in 1957 and reassessed the geophysics done on this area. This geophysical work was not originally recorded for assessment. Talisman Minerals Limited outlined three anomalous areas worthy of drilling, but no drilling was done and the claims were allowed to lapse (SSM 1326).

RECOMMENDATIONS FOR FUTURE EXPLORATION

Gold

The gold showing on Ballard Lake, has yet to be tested by diamond drilling. There appears to be an association of gold-bearing veins with faults or shear structures oriented at about N70°W to N20°W around the Murray Lake Pluton both in the map-area and in the township to the northwest (L. Bottomley, Cominco geologist, personal communication, 1979). This association is worthy of further investigation.

Base Metals

Drilling by MacFie Explorations Limited [1955] (6) and Belmine Exploration Limited [1956] (1) centred mainly on magnetic and electromagnetic anomalies associated with the ironstones, but economic mineralization was not encountered. The association of interbanded chert and magnetite ironstone is generally sulphide poor. Within 300 m of the ironstone are pyrrhotite-rich zones which contain traces of copper and nickel. The airborne electromagnetic and magnetic surveys done over the area should have detected the presence of a

large amount of pyrrhotite within 30 to 60 m of the surface. The fine grained nature of the felsic metavolcanics suggests that these rocks are possibly of distal character relative to central volcanism. Exploration for stratabound base metal deposits should be appraised in this context.

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Ministry of Natural Resources

Ontario

SYMBOLS

- Glacial striae. Glacial fluting or drumlin.
- Esker.
- Bedrock; (small outcrop, area of outcrop).
- Bedding, horizontal.
- Bedding, top unknown; (inclined, vertical).
- Bedding, top indicated by arrow; (inclined, vertical, overturned).
- Bedding, top (arrow) from grain gradation; (inclined, vertical, overturned).
- Bedding, top (arrow) from cross bedding; (inclined, vertical, overturned).
- Bedding, top (arrow) from relationship of cleavage and bedding; (inclined, overturned).
- Lava flow; top (arrow) from pillows shape and packing. Lava flow; top in direction of arrow.
- Direction of paleocurrent.
- Schistosity; (horizontal, inclined, vertical).
- Gneissosity; (horizontal, inclined, vertical).
- Foliation; (horizontal, inclined, vertical).
- Banding; (horizontal, inclined, vertical).
- Lineation with plunge.
- Geological boundary; (observed, position interpreted, deduced from geophysics).
- Magnetic contour value in gammas. Magnetic attraction.
- Fault; (observed, assumed). Spot indicates down throw side, arrows indicate horizontal movement.
- Lineament.
- Jointing; (horizontal, inclined, vertical).
- Drag folds with plunge.
- Anticline, syncline, with plunge.
- Drill hole; (vertical, inclined, projected vertically, projected up dip). Overburden shown.
- Location of sample.
- Vein, vein network. Width in inches or feet.
- RA Radioactivity.
- Swamp.
- Motor road. Provincial highway number encircled where applicable.
- Other road. Trail, portage, winter road.
- International or Provincial boundary.
- County, District, Regional or District Municipal Boundary.

84°15'

84°10'

48°10'

BRUYERE

DOLSON

DEBASSIG

MATCHINAMEIGUS LAKE

Dingman Creek

Upper Dingman Lake

High Lake

McMartin Creek

Murray Creek

Fletcher Lake

Ballard Creek

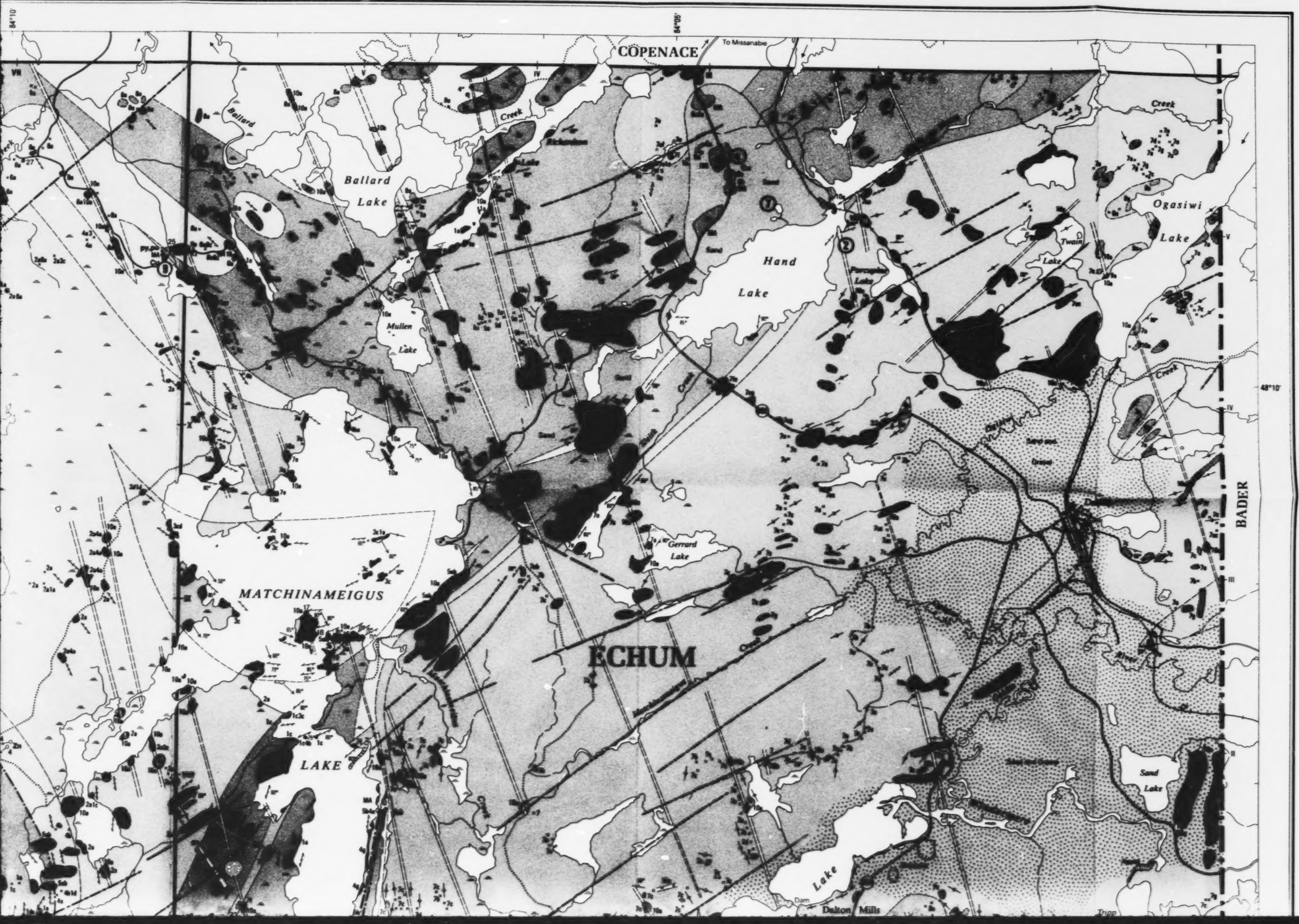
Ballard Lake

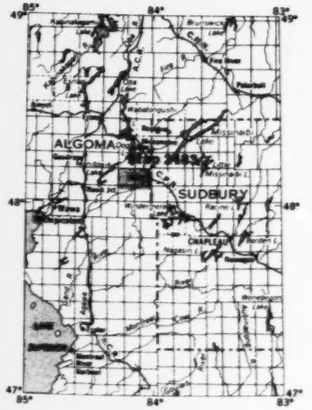
Mullen Lake

Ministry of Natural Resources

Ontario

Ontario Geological Survey
Map 2483
Matchinameigus Lake.





Scale: 1 inch to 50 miles

NTS Reference: 42C/1

LEGEND

PHANEROZOIC

CENOZOIC

QUATERNARY

PLEISTOCENE AND RECENT

Clay, sand, gravel, silt, till and swamp deposits.

UNCONFORMITY

PRECAMBRIAN

LATE PRECAMBRIAN

ULTRAMAFIC INTRUSIVE ROCKS

11 — *11a Lamprophyre (kimberlitic affinity).*
11b Mica peridotite; serpentinized.

INTRUSIVE CONTACT

MAFIC INTRUSIVE ROCKS

10 Unsubdivided.
10a Quartz diabase.
10b Porphyritic quartz diabase.

INTRUSIVE CONTACT

MIDDLE PRECAMBRIAN

ULTRAMAFIC TO MAFIC INTRUSIVE ROCKS

9 Unsubdivided.
9a Pyroxenite, hornblende pyroxenite.
9b Mica peridotite.

INTRUSIVE CONTACT

EARLY PRECAMBRIAN

FELSIC INTRUSIVE ROCKS

LATE FELSIC INTRUSIVE ROCKS

8 Unsubdivided.
8a Granodiorite (massive).
8b Quartz monzonite (weakly foliated).
8c Felsic dikes, aplite.

INTRUSIVE CONTACT

EARLY FELSIC INTRUSIVE ROCKS

7 Unsubdivided.
7a Migmatitic granitic rocks (biotite-quartz-feldspar gneisses)

Overburden shown.

Location of sample.

Vein, vein network. Width in inches or feet.

RA — Radioactivity.

Swamp.

69 — Motor road. Provincial highway number encircled where applicable.

Other road.
Trail, portage, winter road.

International or Provincial boundary.

County, District, Regional or District Municipal Boundary, with mile post.

Municipal Boundary, (City, Town, Improvement District, Incorporated Township), with milepost.

Township, Indian Reserve, Meridian, Base Line, Provincial Park, with milepost, (surveyed, unsurveyed).

2 (1) — Mining property, surveyed. Mineral deposit or mining property, unsurveyed.

Surveyed line.
Unsurveyed line.

All boundary and survey lines are approximate position only.

Some symbols may not occur on this map.

PROPERTIES, MINERAL DEPOSITS

1. Belmine Exploration Ltd., [1956].
2. Cordell Gold Mines Ltd., [1952].
3. Frobisher Ltd., [1957].
4. Hand Lake occurrence.
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8. Multi-Minerals Ltd., [1966].
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Information current to December 31, 1978.

Former properties on ground now open for staking are only shown if exploration data is available. A date in square brackets indicates last year of exploration activity. For further information see report.

SOURCES OF INFORMATION

Geology by M.J. Downes and assistants, Ontario Geological Survey, 1978.
Geology is not tied to surveyed lines.

Files of the Resident Geologist's office, Sault Ste. Marie. Maps and files of the Algoma Central Railway, Lands and Forest Division, Sault Ste. Marie. Files of the Assessment Research office, Ontario Geological Survey, Toronto.

Aeromagnetic map (OGS-GSC) 2206G.

Preliminary maps (OGS), P.2302 and P.2303, Matchinameigus Lake (west and east halves), scale 1:15 840, issued 1979.

Cartography by P.A. Wisbey and assistants, Surveys and Mapping Branch, 1982.

Basemaps derived from maps of the Forest Resources Inventory, Surveys and Mapping Branch.

Magnetic declination in the area was approximately 6° 45' West in 1978.

Parts of this publication may be quoted if credit is given. It is recommended that reference to this map be made in the following form:

Downes, M.J.

1983: Matchinameigus Lake; Ontario Geological Survey Map 2483, Precambrian Geology Series, scale 1 inch to ½ mile, geology 1978.

Published 1983

Ontario Geological Survey

Map 2483

MATCHINAMEIGUS LAKE

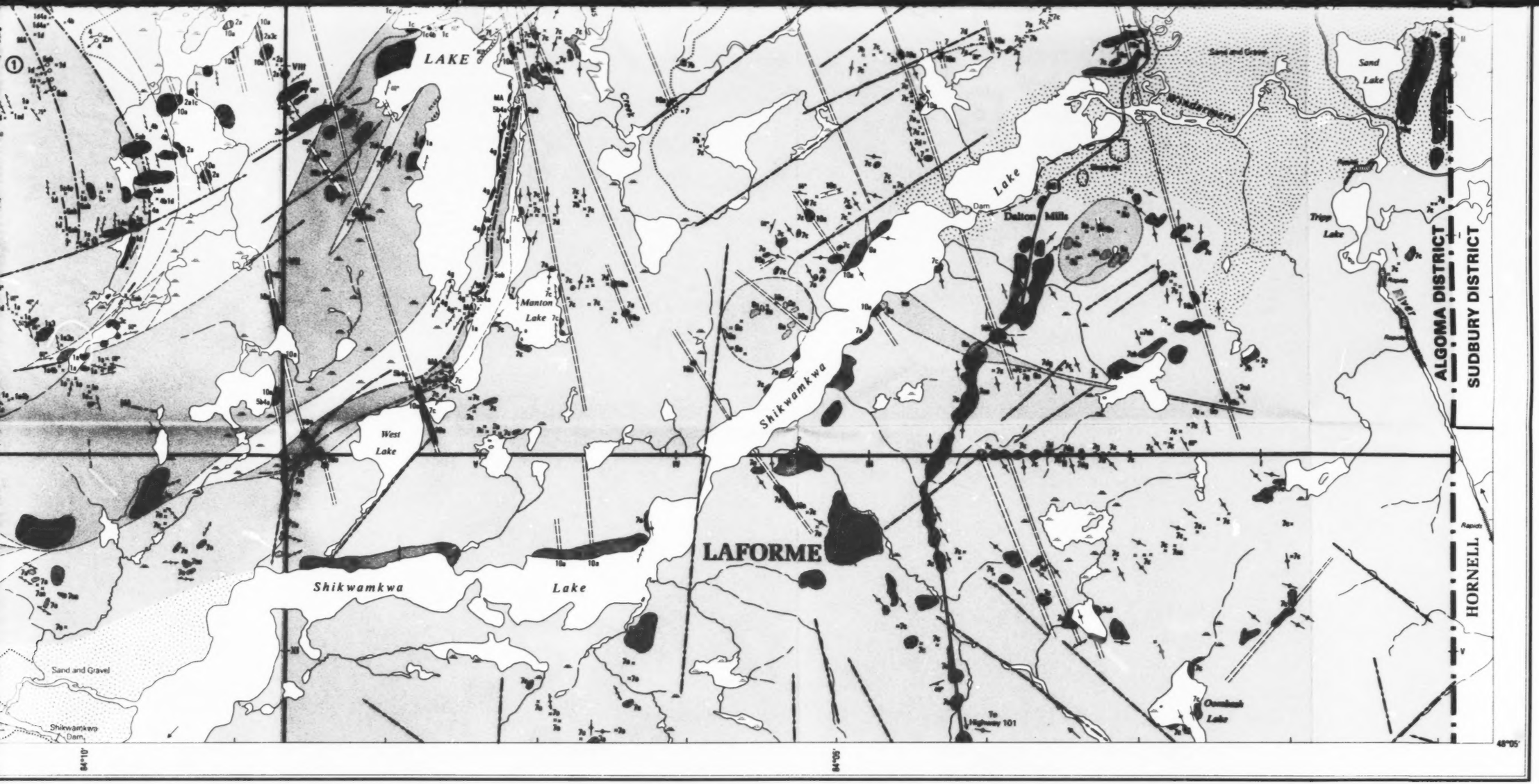
ALGOMA DISTRICT

Scale 1:31,680 or 1 Inch to ½ Mile

Chains 80 60 40 20 0 1

Metres 1000 0 1 2 3 Kilo

Feet 1000 0 5,000 10,000 Feet



Ontario Geological Survey

Map 2483

MATCHINAMEIGUS LAKE

ALGOMA DISTRICT

Scale 1:31,680 or 1 Inch to ½ Mile

60 40 20 0 1 2 Miles

Metres 1000 0 1 2 3 Kilometres

Feet 1000 0 5,000 10,000 Feet

pyroxenite.
9b Mica peridotite.

INTRUSIVE CONTACT

EARLY PRECAMBRIAN

FELSIC INTRUSIVE ROCKS

LATE FELSIC INTRUSIVE ROCKS

8 Unsubdivided.
8a Granodiorite (massive).
8b Quartz monzonite (weakly foliated).
8c Felsic dikes, aplite.

INTRUSIVE CONTACT

EARLY FELSIC INTRUSIVE ROCKS

7 Unsubdivided.
7a Migmatitic granitic rocks (biotite-quartz-feldspar gneisses).
7b Quartz monzonite.
7c Trondhjemite, granodiorite.
7d Hornblende-trondhjemite.
7e Diorite (border phase).
7f Agmatitic migmatite.
7g Amphibolite.
7h Quartzo-feldspathic schist (metasedimentary paleosome character).

INTRUSIVE CONTACT

MAFIC INTRUSIVE ROCKS

6 Unsubdivided.
6a Metagabbro.

INTRUSIVE CONTACT

METAVOLCANICS AND METASEDIMENTS[a]

CHEMICAL METASEDIMENTS[d]

5 Unsubdivided.
5a Chert.
5b Magnetite ironstone.

CLASTIC METASEDIMENTS[d]

4 Unsubdivided.
4a Wacke.
4b Siltstone.
4c Arkose.
4d Dolostone.
4e Phyllite.
4f Conglomerate.
4g Quartz-plagioclase-biotite schist.

FELSIC METAVOLCANICS[d]

3 Unsubdivided.
3a Massive flows.
3b Porphyritic flows.
3c Tuffs.
3d Lapilli-tuff, lapillistone.
3e Crystal tuffs.

INTERMEDIATE METAVOLCANICS

2a Andesitic to dacitic tuffs.

MAFIC METAVOLCANICS[d]

1 Unsubdivided.
1a Massive to foliated flows.
1b Pillowed flows.
1c Tuff, crystal tuff.
1d Chloritic schist.
1e Amygdaloidal flows.

Ag	Silver.
Au	Gold.
cp	Chalcopyrite.
Cu	Copper.
po	Pyrrhotite.
py	Pyrite.
q	Quartz.
Zn	Zinc.

[a] Unconsolidated deposits. Cenozoic deposits are represented by the lighter coloured and uncoloured parts of the map.

[b] Bedrock geology. Outcrops and inferred extensions of each rock unit are shown respectively in deep and light tones of the same colour. Where in places a formation is too narrow to show in colour and must be represented in black, a short black bar appears in the appropriate block.

[c] No age relationships are inferred by the order of the rock units within these groups.

[d] Rocks grouped under these headings are not necessarily all the same age.

POOR

QUALITY

ORIGINAL